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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,670	08/08/2003	John Zagaja	PES-0160	1669
23462	7590	10/07/2005	EXAMINER	
CANTOR COLBURN, LLP			ZHENG, LOIS L	
55 GRIFFIN ROAD SOUTH			ART UNIT	
BLOOMFIELD, CT 06002			PAPER NUMBER	

1742

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/604,670

Applicant(s)

ZAGAJA ET AL.

Examiner

Lois Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 28 and 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                                                     |                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                         | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                                | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>17 August 2004</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of invention group I in the reply filed on 20 July 2005 is acknowledged. Since applicant has not provided the ground(s) of traversal, applicant's election will be treated as an election without traverse.
2. Claims 28-29 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention group II, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 20 July 2005.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-7, 10 and 13-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Carlson et al. US 5,372,689(Carlson).

Carlson teaches an water electrolyzer(i.e. electrochemical cell) comprising an anode, a cathode and an ion exchange membrane separating the two electrodes(Fig. 4

numerals 7, 9 and 5, col. 2 line 66-col. 3 line 3). The water electrolyzer further teaches a porous support member having multiple-pore sizes(col. 3 line 49-col.4 line 56).

Regarding instant claims 1-2, the porous support member of Carlson reads on the claimed porous support member having first and second portions with the second portion having greater porosity than that of the first portion. Even though Gorman does not teach that the bilayer porous support member is sintered, the electrochemical cell of Gorman meets all the structural limitations of the instant claim. The examiner interpret the term "sintered" as describing how the support member is made, i.e. process limitation. Therefore, the claimed limitation of "sintered" support member does not lend patentability to the instant apparatus claim.

Regarding instant claims 3-6, Carlson further teaches that the porosity of the porous support member ranges from about 40% to about 60%. Therefore, the pores in the support member of Carlson having a porosity of about 40-50% meet the limitation of the claimed first portion porosity as recited in instant claims 3-4. The pores of the support member of Carlson having a porosity of about 50-60% meet the limitation of the claimed second portion porosity as recited in instant claims 5-6.

Regarding instant claim 7, since Carlson teaches that the porous support member having multiple pore sizes, the porous support member inherently teaches the claimed third portion having the claimed third portion porosity that is less than or equal to the second portion porosity.

Regarding instant claim 10, Carlson further teaches the claimed channel on the second side of the porous support member as seen in Fig. 4.

Regarding instant claim 13, since Carlson's porous support member has multiple pore sizes, the second portion of Carlson's porous support member inherently have the claimed high porosity and lower porosity regions as claimed.

Regarding instant claim 14, Carlson further teaches that metal screen sets in physical and electrical contact with the porous support member(Fig. 4 numeral 1). The metal screen sets of Carlson read on the pressure pad as claimed.

Regarding instant claims 15 and 17-18, Carlson further teaches that the porous support member can be disposed on both side of the anode or cathode(col. 4 lines 46-50). Therefore, Carlson teaches the additional porous support as claimed. The additional porous support member as taught by Carlson meets the structural limitation of the instant claims 17-18 for the same reason as stated in the rejections of instant claims 1-2 above.

Regarding instant claims 16 and 19, the porous support member of Carlson are inherently capable of functioning as the claimed first and second electrodes.

Regarding instant claim 20, Carlson's electrochemical apparatus comprises the claimed first and second electrodes, the claimed ionic membrane, the claimed porous support member and the claimed pressure assembly. In addition, since Carlson teaches the claimed porous support member, Carlson inherently teaches the claimed flow field.

Regarding instant claim 21-22, the instant claims are rejected for the same reason as stated in the rejection of instant claims 1-2 and 17-18 above.

Regarding instant claim 23, the instant claim is rejected for the same reason as stated in the rejection of instant claims 16 and 19 above.

Regarding instant claims 24-25, Carlson further teaches that the electrochemical cell is capable of operating at a pressure gradient of up to about 2000psi and greater (col. 2 lines 66-68), which meets the claimed pressure limitations as recited in instant invention.

Regarding instant claim 26, the instant claim is rejected for the same reason as stated in the rejection of instant claim 10 above.

Regarding instant claim 27, the instant claim is rejected for the same reason as stated in the rejection of instant claim 14 above.

5. Claims 1-5, 8 and 15-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Gorman et al US Patent Application Publication 2002/0086195(Gorman).

Gorman teaches an electrochemical cell comprising first and second electrode separated by an ionic membrane(Fig. 2, numerals 42a, 38a and 40a), and a bilayer electrode support member on both side of the electrodes(fig. 2 numerals 44a and 46a), the bilayer electrode support member comprising a fine pore layer with 50% porosity and a coarse pore layer with 65-75% porosity(page 2 paragraph 13).

Regarding instant claims 1-2 and 8, the finer layer of the bilayer support member as taught by Gorman reads on the claimed first portion of the porous support member. The coarse layer of the bilayer support member as taught by Gorman reads on the claimed second portion of the porous support member. Even though Gorman does not teach that the bilayer porous support member is sintered, the electrochemical cell of

Gorman meets all the structural limitations of the instant claim. The examiner interprets the term "sintered" as describing how the support member is made, i.e. process limitation. Therefore, the claimed limitation of "sintered" support member does not lend patentability to the instant apparatus claim.

Regarding instant claims 3-4, the finer layer of the bilayer support member as taught by Gorman reads on the claimed first portion porosities of less than or equal to about 60% as recited in instant claim 3 and the claimed porosity of about 35% to about 50% as recited in instant claim 4.

Regarding instant claim 5, the coarse layer of the bilayer support member as taught by Gorman reads on the claimed second portion porosity of greater than or equal to about 50%.

Regarding instant claim 15 and 17-18, Gorman teaches the claimed additional porous support member with the second portion(i.e. coarse layer) having greater porosity than the first portion(i.e. fine layer) on the other side of the membrane as claimed.

Regarding instant claim 16 and 19, the bilayer support members of Gorman are inherently capable of functioning as the first and second electrodes as claimed.

6. Claim 20 is rejected under 35 U.S.C. 102(e) as being anticipated by Anderson et al US Patent Application Publication 2003/0230495 A1(Anderson).

Anderson teaches an electrochemical cell comprising a first electrode, a second electrode and an ionic membrane separating the two electrodes(Fig. 4 numeral 75, 77 and 73). The electrochemical cell further comprises a porous fluid flow field

member(Fig. 4 numerals 84 and 74) and a pressure pad(Fig. 4 numeral 71). Therefore, the apparatus of Anderson meets the structural limitations of the instant invention.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gorman.

The teachings of Gorman are discussed in paragraph 5 above. In addition, the 60% - 75% porosity of the coarse layer of the bilayer support member of Gorman overlaps the claimed second portion porosity of about 50% to about 70%. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05. The selection of claimed second portion porosity range from the disclosed coarse layer porosity of Gorman would have been obvious to one skill in the art since Gorman teaches the same utility in its coarse layer porosity range.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson.

The teachings of Carlson are discussed in paragraph 4 above. Carlson further teaches that the pore size of the porous support member depends on the size of the molecules passing through the pores(col. 4 lines 19-21). Therefore, it would have been obvious to one of ordinary skill in the art to have routinely optimized the pore size to arrive at the claimed porosity gradient depending on the size of the molecules passing through the pores as taught by Carlson.



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10. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson in view of Skoczylas et al. US 6,666,961 B1(Skoczylas).

The teachings of Carlson are discussed in paragraph 4 above. However, Carlson does not explicitly teach the claimed channel patterns as recited in instant claims 11-12;

Skoczylas teaches an electrochemical cell comprising anode and cathode separated by an ionic membrane and flow fields with grooves and other flow features (col. 7 lines 14-17, Fig. 4).

Therefore, one skilled in the art would have found the claimed flow channel patterns only a matter of design choice absent of persuasive evidence demonstrating particular advantages of the claimed channel patterns since Skoczylas teaches that various flow features can be used to perform the same function.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

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